Airspace Technology Demonstration 2 (ATD-2)

Field Demo Progress Update & Remote Demo/Brief

Shivanjli Sharma, Pete Slattery, Kerry Facer, Al Capps

Nov 9, 2017

Remote Demo Series – Schedule

- ~~ATD-2 101 (General Briefing and Demo)~~ ~~May 5th 11AM–1PM EST~~
- ~~ATD-2 101 (General Briefing and Demo)~~ ~~June 9th 11AM–1PM EST~~
- ~~ATD-2 201 (Surface/TBFM Scheduling)~~ ~~July 20th 10–11:30 AM EST~~
- ~~ATD-2 101 (General Briefing and Demo)~~ ~~Aug 3rd 10 - Noon EST~~
- ~~ATD-2 201 (Surface ON time predictions, Runway assignments)~~ ~~Aug 24th 10:30–Noon EST~~
- ~~ATD-2 301 (Fuser, SWIM Processing & Mediation, Matching)~~ ~~Sept 7th 10:30–Noon EST~~
- ~~ATD-2 201 (Tactical Surface Metering)~~ ~~Sept 21st 10:30–Noon EST~~
- ~~ATD-2 201 (Ramp Traffic Tools, Capabilities, Best Practices)~~ ~~Oct 12th 10:30–Noon EST~~

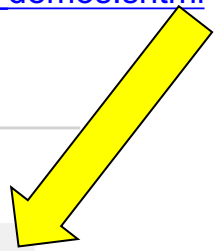
- ATD-2 101 (General Briefing, Field "go-live" status update) Nov 9th 10:30–Noon EST
- ATD-2 201 (Dashboard & Metrics-Baseline, Current Reports, Data Analysis) Nov 30th 10:30–Noon EST
- ATD-2 201 (Understand & Process ATC Restrictions in the NAS) Dec 13th 10:30-Noon EST
- What would like to see here? Send input to Al.Capps@nasa.gov

ATD-2 Remote Demo Objectives

- Keep broad group of ATD-2 stakeholders informed of progress in an inexpensive and unobtrusive manner
- Demonstrate actual system capability and lessons learned (as opposed to documents/plans)
- Take input from stakeholders that can be used to improve the ATD-2 system, processes and/or outreach
- Identify areas where more detailed discussion is desired/warranted

Upcoming Demos!

Go to https://www.aviationsystemsdivision.arc.nasa.gov/research/tactical/atd2_remote_demos.shtml to learn about upcoming ATD-2 remote demos!



ATD-2 Remote Demos

To Join…

1. Go to: **https://ac.arc.nasa.gov/atd2/**
   Enter as a guest and type your name. NASA Employees can log-in with their email and password (NDC Credentials).
2. Dial the Telecon Number: **1-844-467-6272, Passcode: 592382#**

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Schedule

ATD-2 201 (Tactical Surface Metering)	Sept. 21st 10:30–Noon ET
ATD-2 201 (Ramp Traffic Tools, Capabilities, Best Practices)	Oct. 12th 10:30–Noon ET
ATD-2 101 (General Briefing, Field "go-live" status update)	Oct. 26th 10:30–Noon ET
ATD-2 201 (Real-time Dashboard and Post Ops)	Nov. 9th 10:30–Noon ET
ATD-2 201 (Metrics-Baseline, Current Reports, Data Analysis)	Nov. 30th 10:30–Noon ET
ATD-2 201 (Understand & Process ATC Restrictions in the NAS)	Dec. 13th 10:30-Noon ET

Demo Recordings

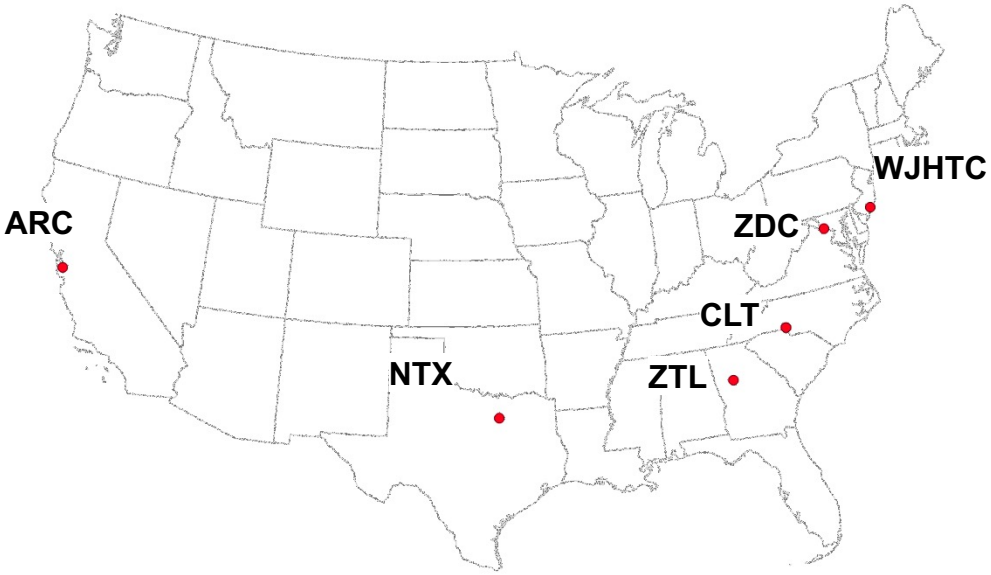
- The audio and video from this demo are being recorded

RECORDING IN PROGRESS

Phase 1 Go Live Status - Agenda

- Overview of deployment for Phase 1
- Description of the ATD-2 system running in the field
- Phase 1 micro phases or stages
- Discussion of Phase 1A and 1B along with user feedback
- Updates to the system in the field since Phase 1A

Installations for Phase I



Installations for Phase I

ARC
User Interfaces (UI)
- ARC labs

Data Interfaces (DI)
- SWIM VPN
- NASQuest
- TLFM

NTX
IADS system core

User Interfaces (UI)
- ZFW TMU
- D10 TMU
- DFW ATCTs
- AAL IOC
- DFW Airport
- NTXlab

Data Interfaces (DI)
- AAL FlightHub
- FlightStats
- NPN edge (NASA)

WJHTC
User Interfaces (UI)
- STBO lab

Data Interfaces (DI)
- SWIM DTS-E
- TBFM proxy
- NPN edge (FAA)

NICS circuit in place

NICS circuit in work

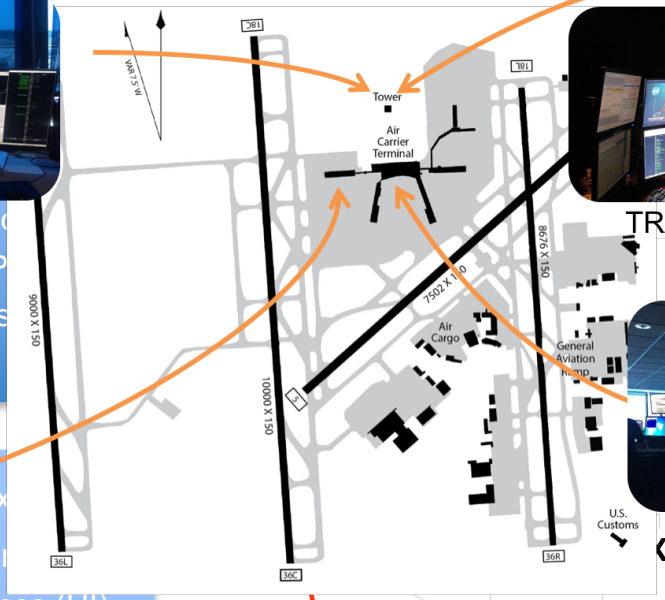
FAA/NASA NextGen Prototyping Network (NPN)

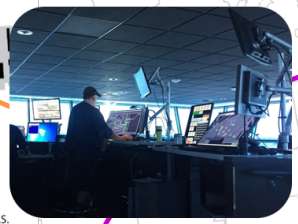
Installations for Phase I

ATC-T TMU

TRACON TMU

Airport Ops





Ramp Tower

WJHTC

ZDC

CLT

ZTL

NASA Integrated Communication Services (NICS) WAN

WJHTC

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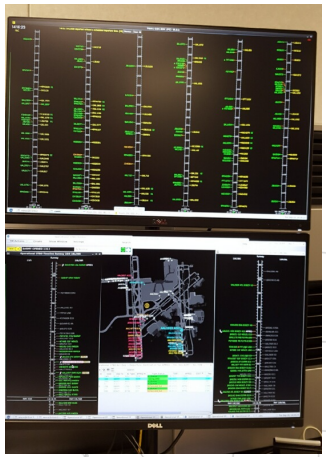

ZDC
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- TMU
- Back room

WJHTC
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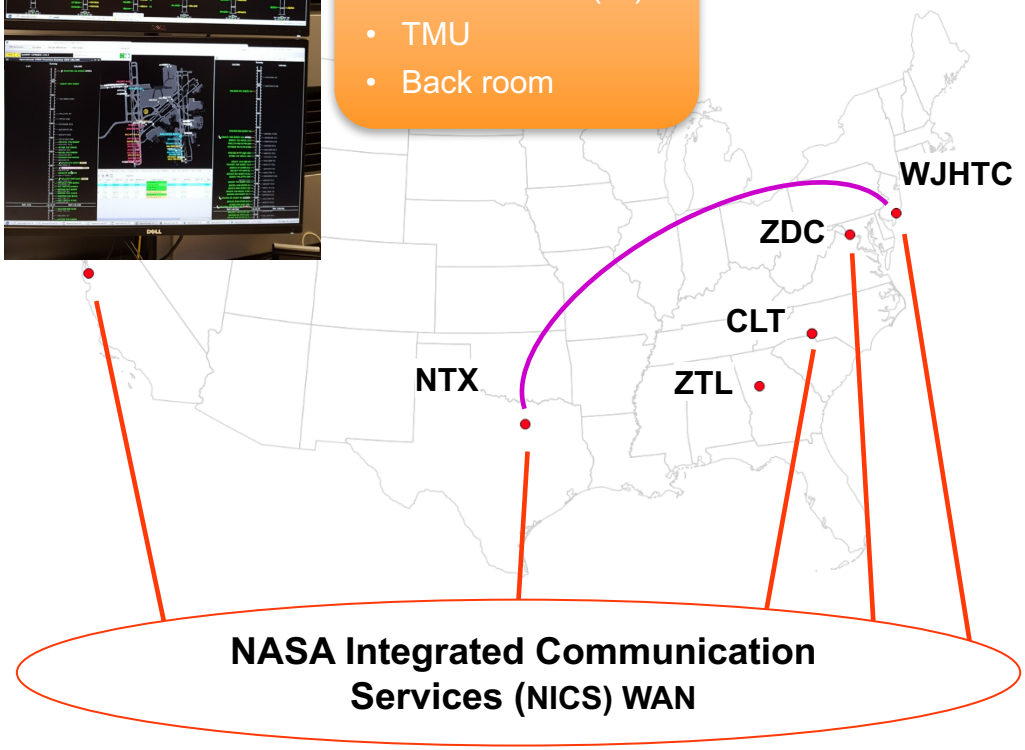

CLT
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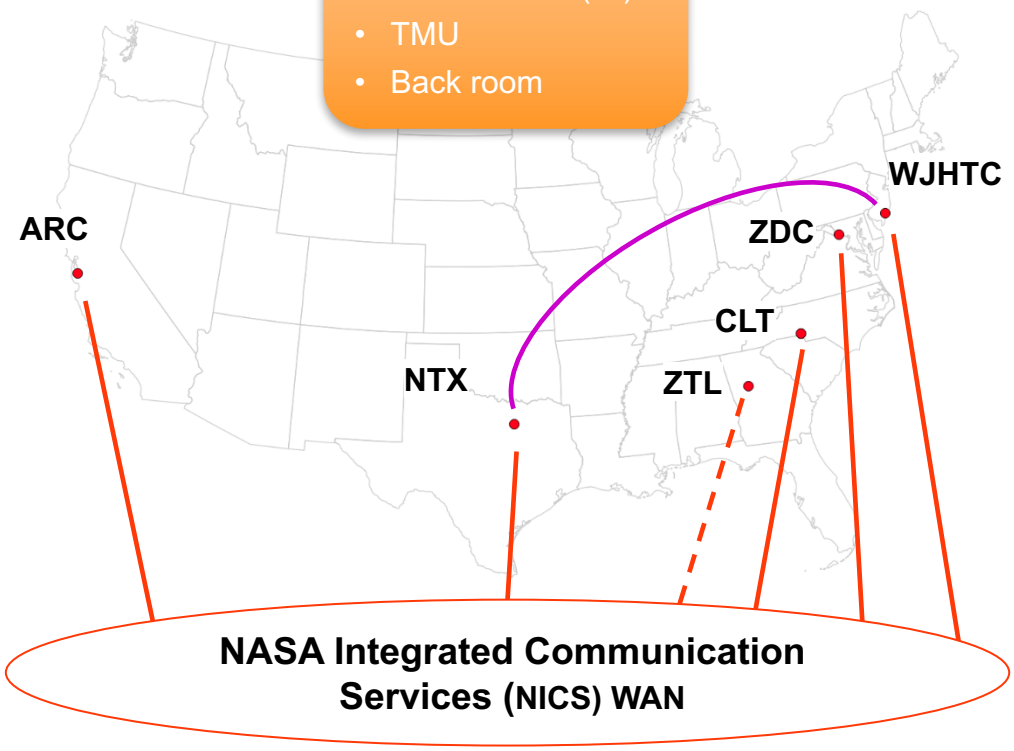

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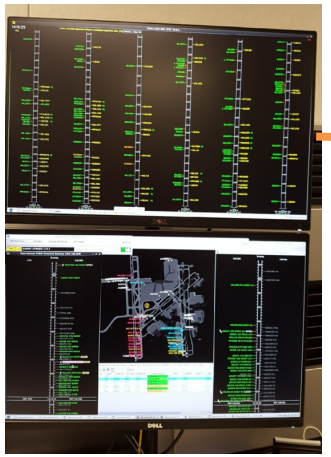
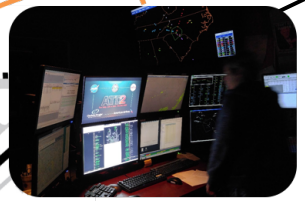
Phase I Deployment Overview

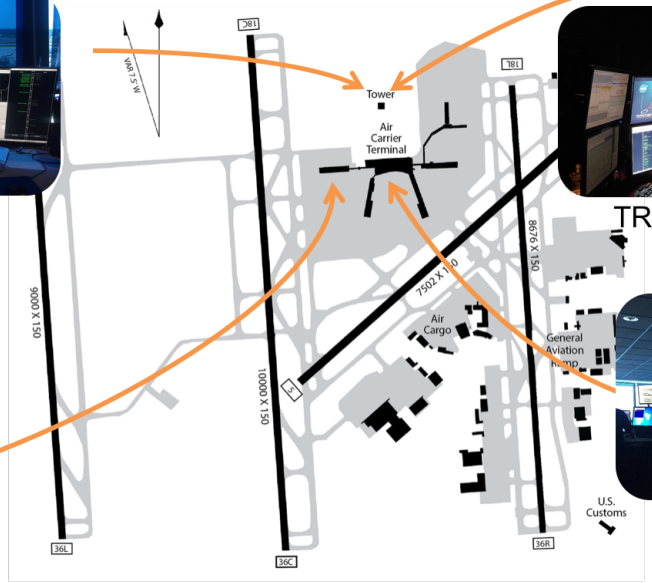


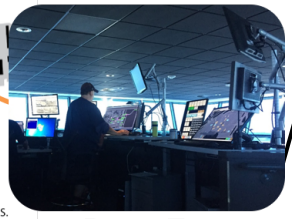
ATC-T TMU



TRACON TMU

Airport Ops

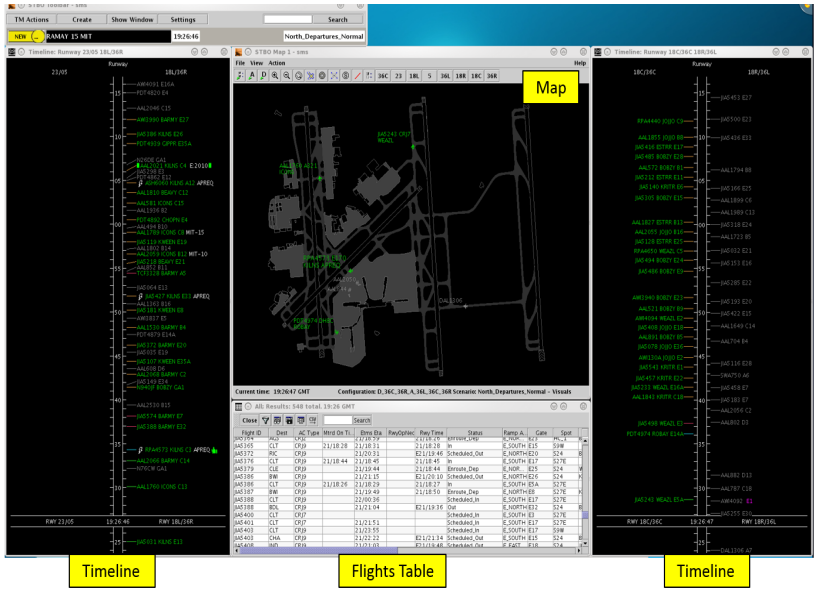




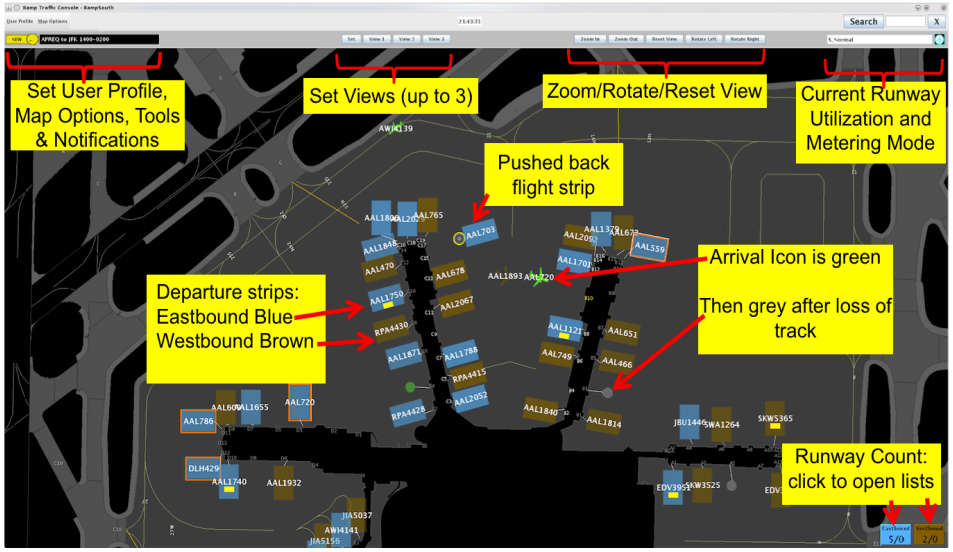
Ramp Tower

ATD2 System Running in the Field

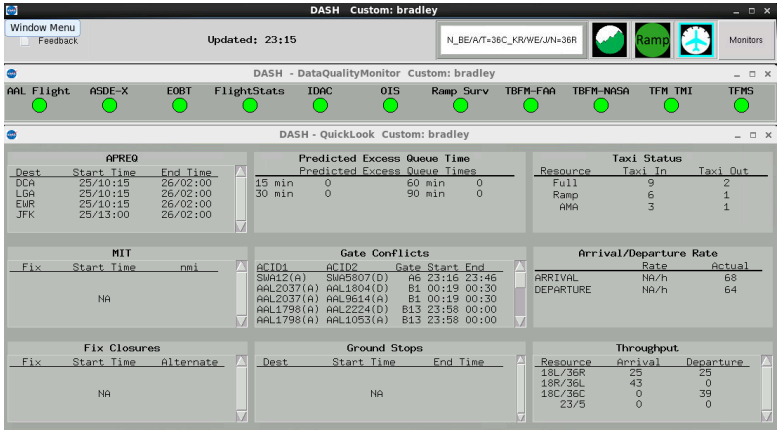
STBO – Surface Trajectory Based Operations



RTC – Ramp Traffic Console

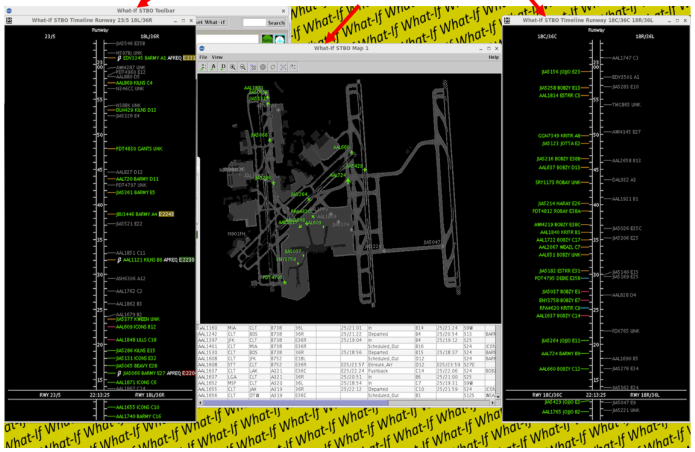


DASH – Data Analysis and System Health



What If System

Title bars of all windows labeled *What-If*



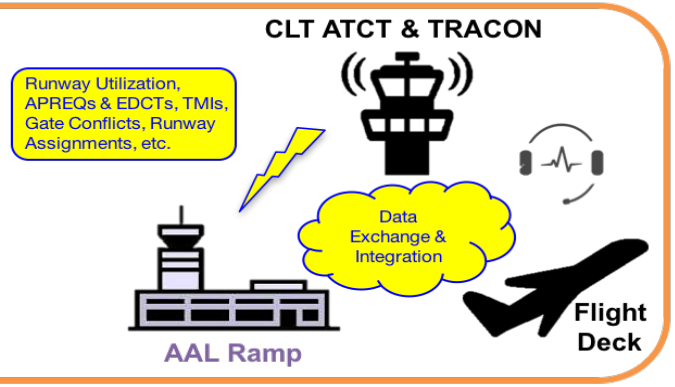
Phase 1 Micro Phases or Stages

1A

Phase 1A: Data Exchange & Integration

Target Date: Sep 29, 2017

Description: The focus of this phase is on use of the ATD-2 system for all data exchange features between ATCT and the ramp as part of daily operations. It starts with the second bank of the day.

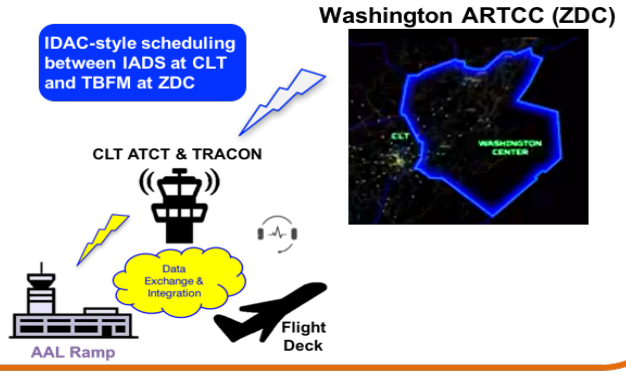


1B

Phase 1B: IDAC Style APREQ Negotiation with ZDC + Phase 1A

Target Date: Oct 26, 2017

Description: The focus of this phase is on use of the ATD-2 system for IDAC style electronic negotiation with ZDC for APREQ/CFR departure scheduling and expanded data exchange beyond bank two.

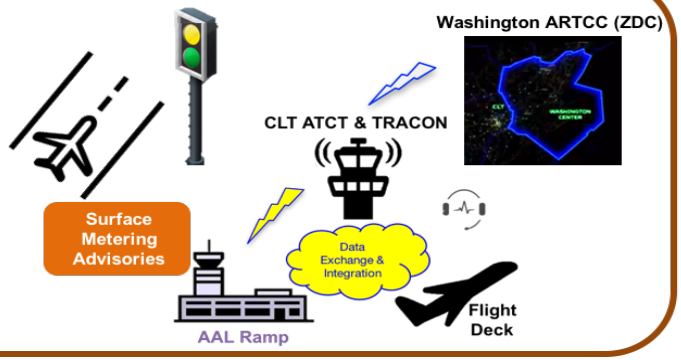


1C

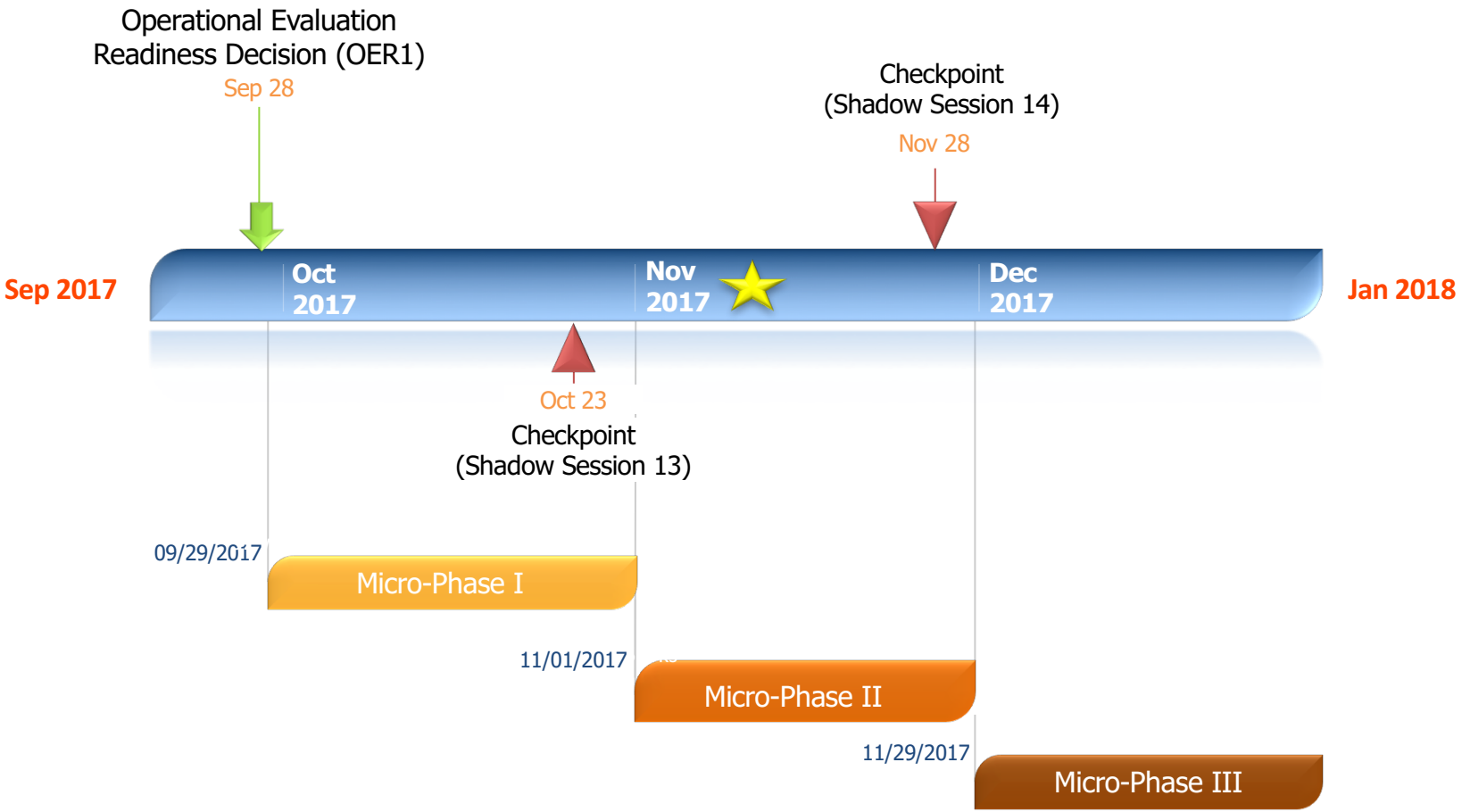
Phase 1C: Surface Metering + Phase 1A & 1B

Target Date: Nov 29, 2017

Description: The focus of this phase is on use of the ATD-2 system for all data exchange features during daily operations and utilization of surface departure metering during bank two.



Phase I Micro-Phase Timeline



Phase 1A Recap

- Phase 1A: Data Exchange and Integration
  - Familiarization period focused on exchange of data electronically between ATCT and the ramp
  - Information such as runway utilization, APREQ times, and departure fix closures, etc. communicated electronically between ATCT and the ramp

- Started on September 29, 2017 and we have seen almost daily use by both the ramp and ATCT of the IADS system
  - 25 out of 27 days system used in Phase 1A
  - System use consists of use during bank two and generally throughout the morning shift

- Field demo partner thoughts on Phase 1A?

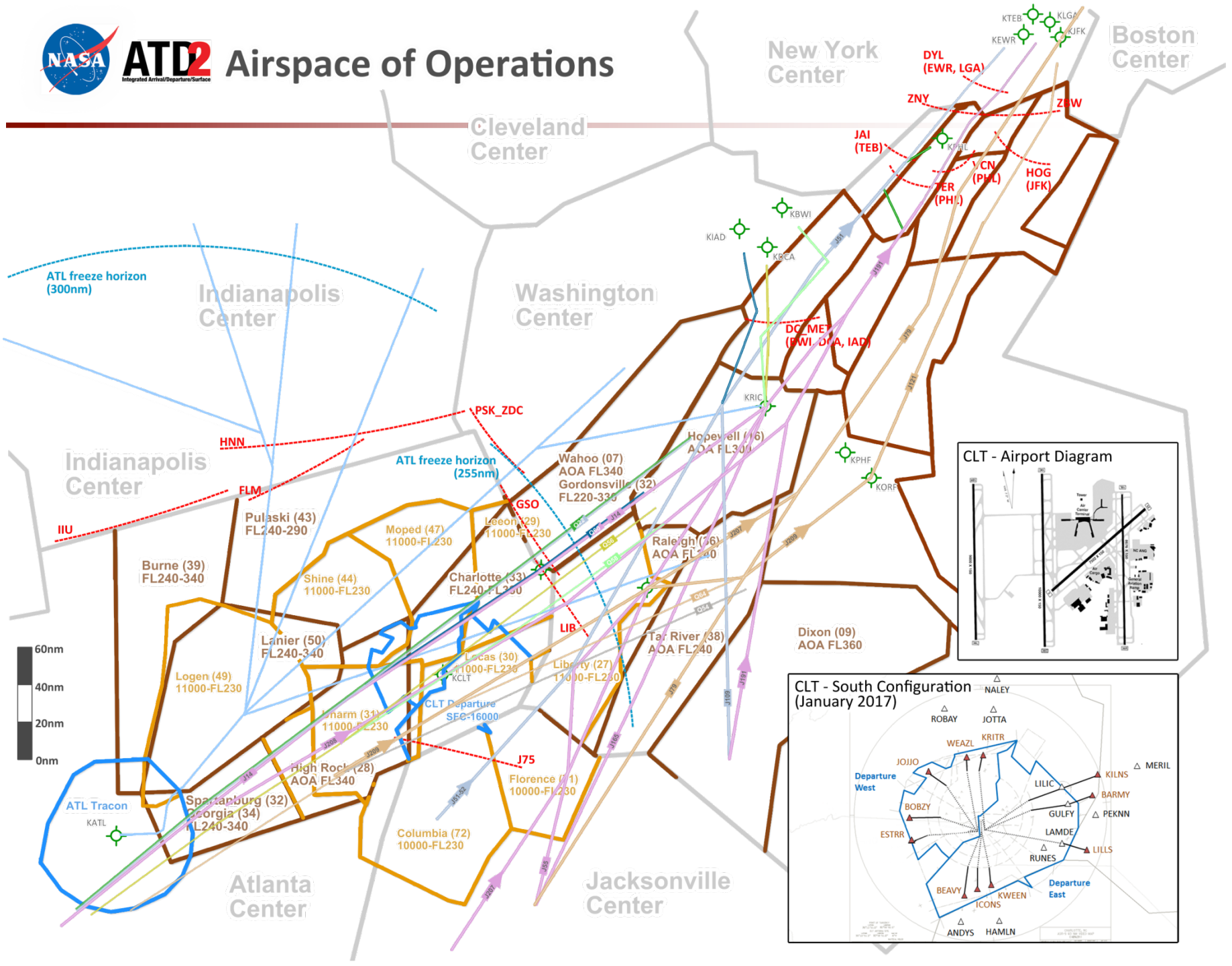
Overview of the Journey to Enable Phase 1B

- Phase 1B “go live” was the culmination of 17 months of collaboration between the NASA ATD-2 team, multiple FAA organizations, and the TBFM contractor team.

- Implemented a secure and reliable network interface between the NASA ATD-2 IADS system at CLT and the operational FAA TBFM system at Washington ARTCC to enable IDAC style electronic negotiation

- Highlights of the timeline to achieve connectivity to operational TBFM:
  - Jun 2016: NASA ATD2 and FAA TBFM PO agreement in principle
  - Mar 2017: Leidos SIG Issue TBFM23605 reviews completed
  - Apr 2017: TBFM NASA Proxy solution presented to FAA Architecture Review Board
  - Jun 2017: Leidos delivers TBFM Release 4.6.1-p2 (i.e. patch 2) with ATD-2 capability
  - Jul 2017: Extensive work to configure TBFM NASA Proxy
  - Aug 2017: On-site testing at WJHTC
  - Sep 2017: Test NCP signed
  - Oct 2017: Interconnection Security Agreement signed by Authorizing Official
  - Nov 2017: Electronic negotiation commences between CLT ATCT and ZDC

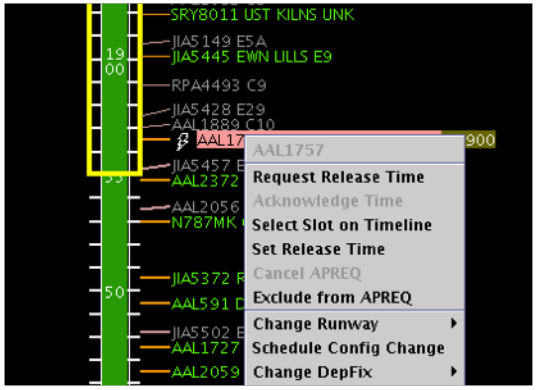
ATD2 Airspace of Operations



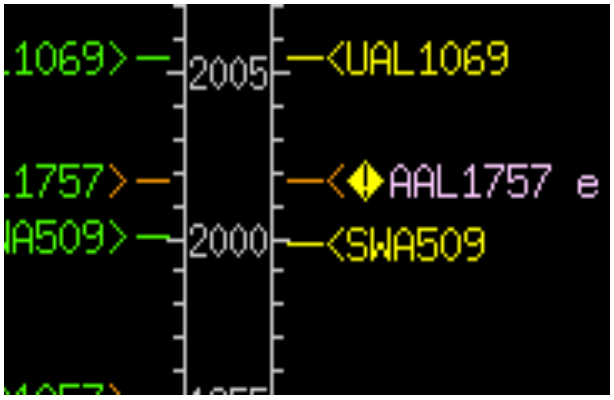
Phase 1B Thus Far

- Phase 1B: Started on November 1st and Introduced IDAC style negotiation with ZDC
  - CLT ATCT has been actively using STBO to electronically negotiate APREQ times
  - AAL ramp controllers electronically receive the negotiated time via RTC

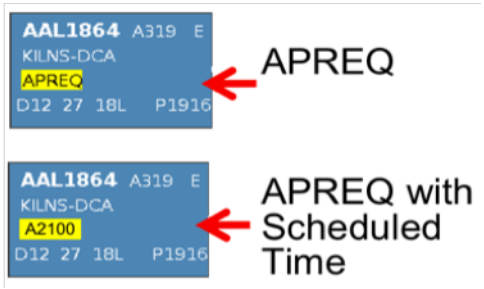
STBO at CLT ATCT



TBFM at ZDC

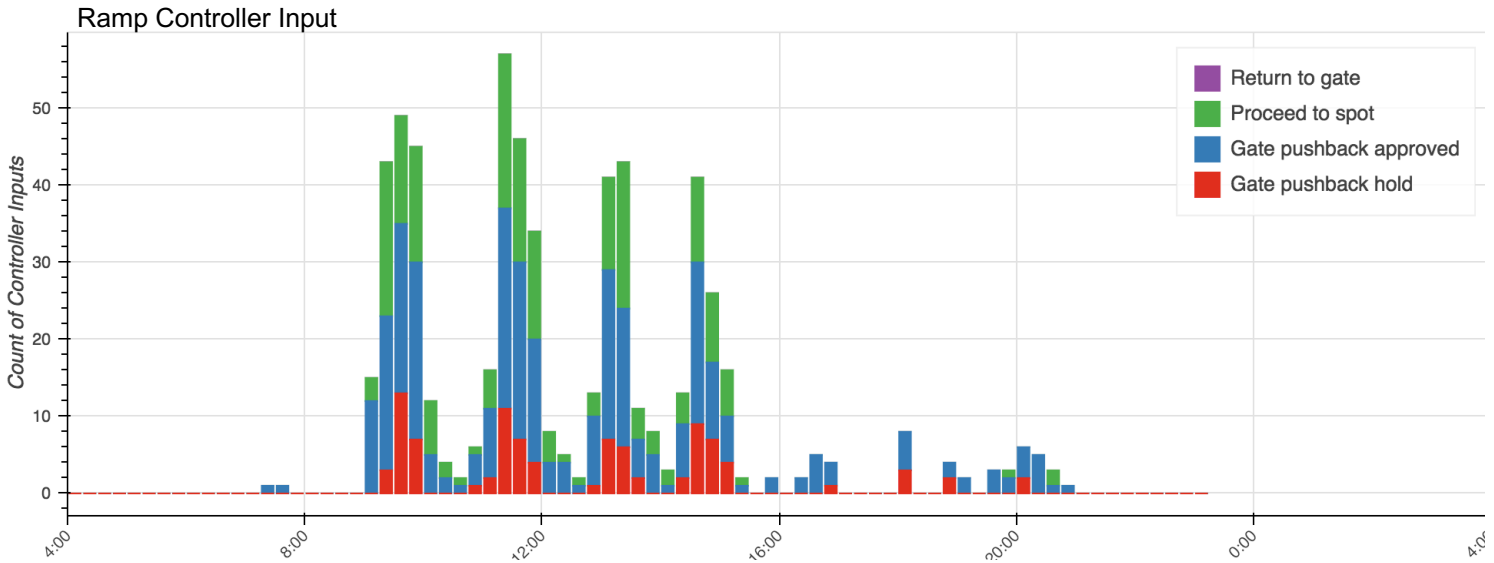


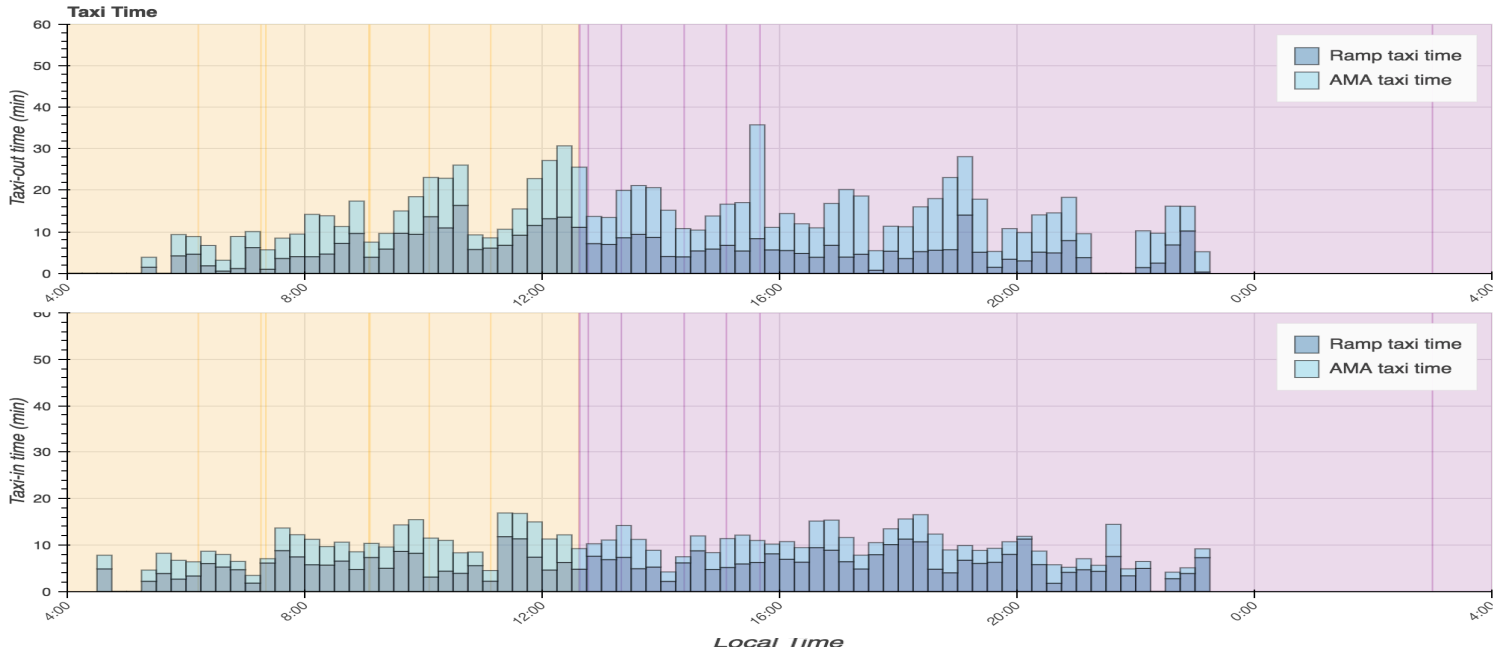
RTC at CLT AAL Ramp



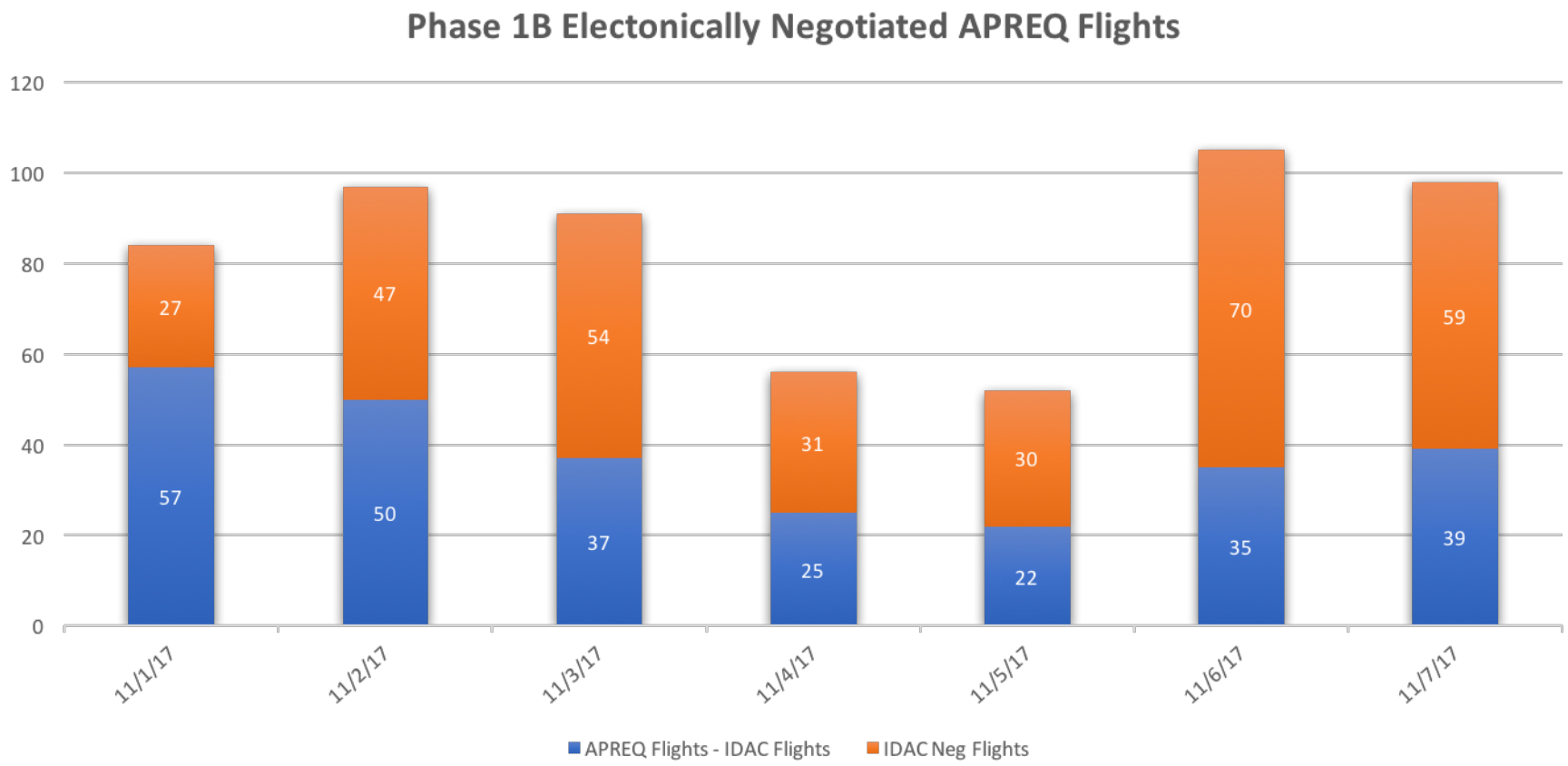
- Field Demo Partner thoughts on Phase 1B thus far?

Snapshot of System Use – Nov 7, 2017



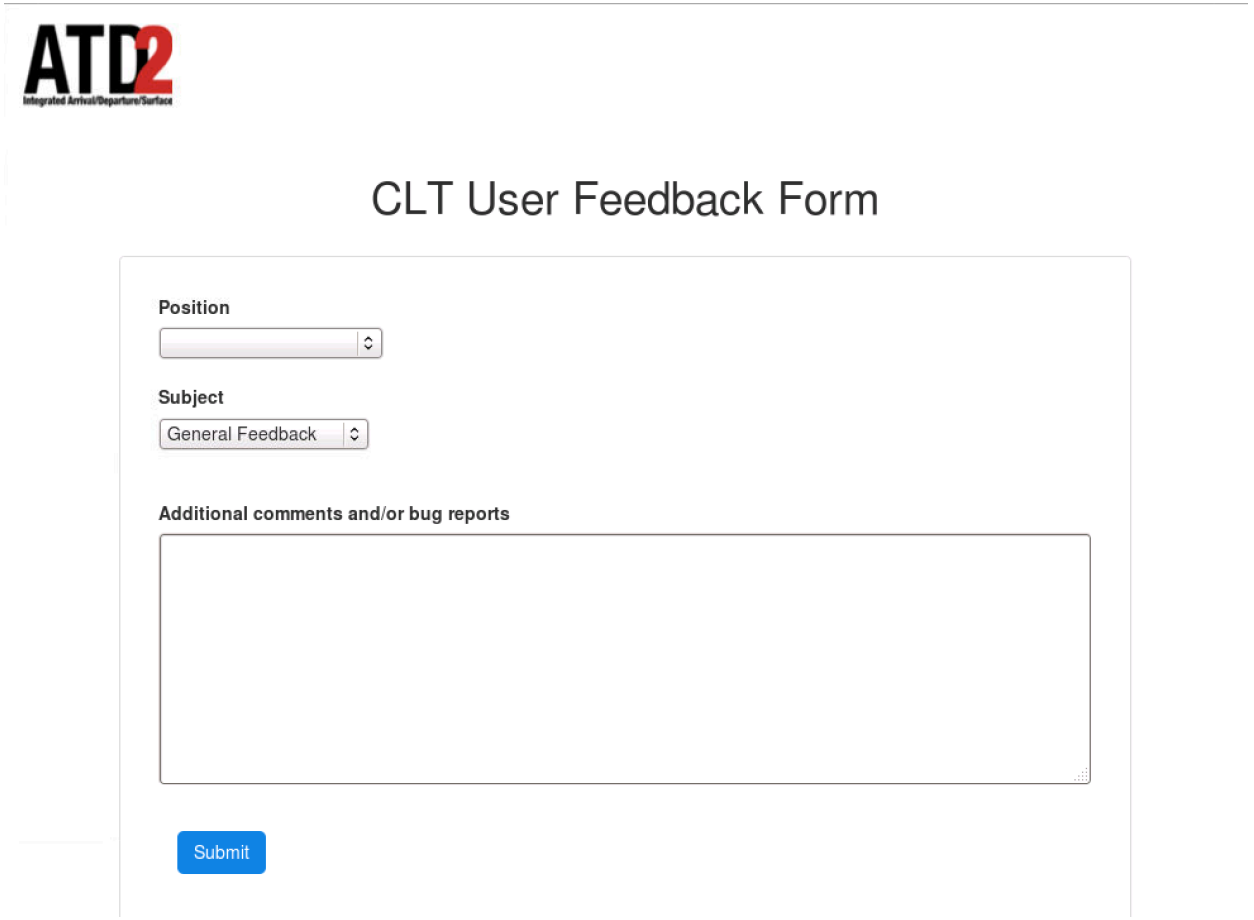


Flights Electronically Negotiated with ZDC in Phase 1B



Total # of Flights with APREQs	84	97	91	56	52	105	98
% Electronically Negotiated	32%	48%	59%	55%	58%	67%	60%

Feedback Reports from the Field



Feedback Provided Thus Far

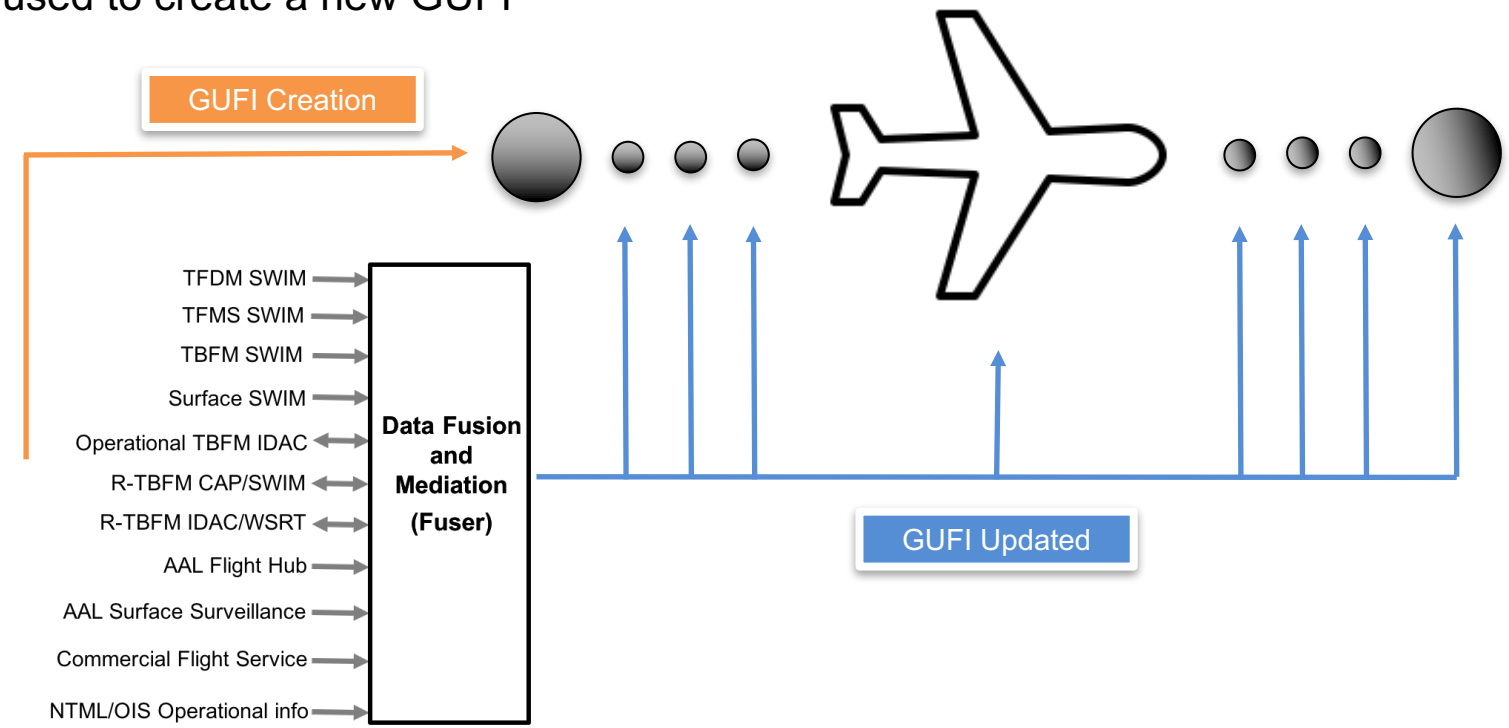
- Received approximately 200 entries from the users via the feedback form on the DASH

- Established a process to handle these entries:
  - Each feedback form entry is assigned to a jira ticket or number
  - The general feedback, or issue, then proceeds through a dispositioning in which they are categorized as:
    - Requiring additional data analysis
    - Known issue and then associated with the appropriate software release
    - A new bug and then assigned to a software release
    - New feature request
    - Training Needed
    - General Feedback

Matching Data from Many Feeds to a Flight

- As the IADS system parses in data from a variety of disparate sources, both FAA SWIM feeds and industry feeds, the correlation of these data feeds to a single flight is a challenge
  - Developed a series of flight mediation rules to enable sorting through duplicate and inconsistent sources of data

- To facilitate this matching a Globally Unique Flight Identifier (GUFI) is created for a flight and then as new data emerges it is used to match to either an existing GUFI or is used to create a new GUFI



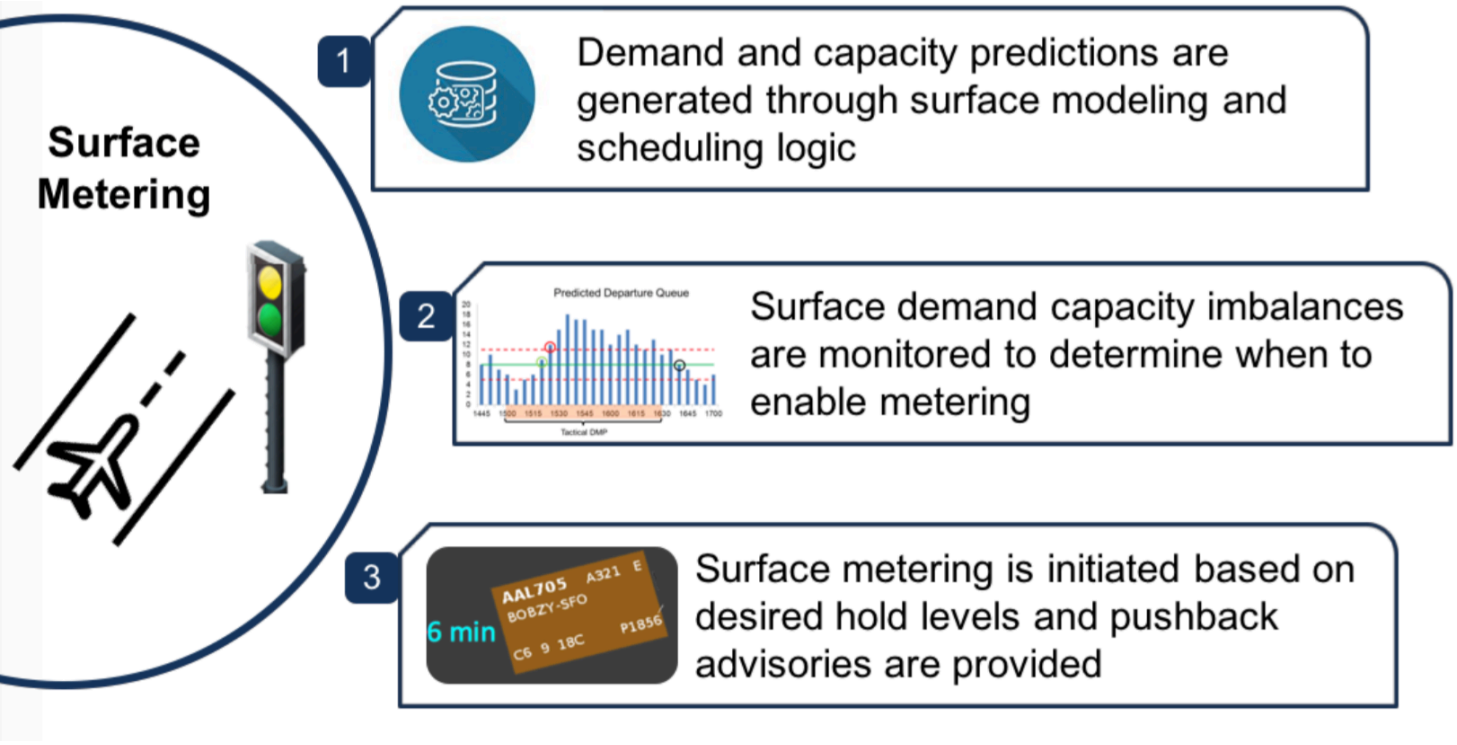
Software Updates to Address Lessons Learned

- System running in the field has been updated with 2 software updates along with a planned release prior to the start of Phase 1B

- Software releases have focused on near term needs:
  - Refinements to algorithms that check data consistently before applying it to internal system data models
  - Enabling use of redundant feeds
  - Enabled users in the ramp to create a target for an existing flight in the system
  - Provided method to reposition flights to account for flights placed in the hardstand or moved to the hanger

Looking Ahead to Phase 1C

- Field demo partners are meeting on November 28th to discuss the transition to Phase 1C targeted for November 29th



Q&A

- Questions?

ATD-2
Integrated Arrival/Departure/Surface

NASA

Thank you!